



US Army Corps
of Engineers
Great Lakes &
Ohio River Division

Navigation Program

GREAT LAKES - ST. LAWRENCE SEAWAY STUDY



Proposed Replacement
Soo Lock



Indiana Harbor
Deep Draft



Arcadia Harbor
Shallow Draft



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Navigation Maintenance Projects



Calumet Harbor II

Deep Draft Harbors

- 20 Deep draft harbors typically require dredging



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Shallow Draft Harbors

- 15-20 should be dredged annually to maintain project depth



Michigan City Harbor IN



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Navigation Maintenance Projects

FY04 Dredging – Lake Ontario

Great Sodus Bay Harbor NY	30,000
Oak Orchard Harbor NY	172,000
Oswego Harbor NY	20,000
Cooley Canal Harbor OH	20,000
Rochester Harbor NY	100,000
TOTAL QUANTITY CY 5 projects	158,000



Rochester Harbor, NY





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FY04 Dredging – Lake Erie

Bolles Harbor MI	30,000
Buffalo River NY	172,000
Cleveland / Cuyahoga River OH	215,000
Cooley Canal Harbor OH	20,000
Conneaut Harbor OH	80,000
Dunkirk Harbor NY	10,000
Rocky River Harbor OH	23,000
Sandusky Harbor OH	155,000
Toledo / Maumee River	650,000
Toussaint Harbor OH	20,000
Vermillion Harbor OH	23,000
West Harbor OH	42,000
TOTAL QUANTITY CY 12 projects	1,440,000



Cleveland Harbor, OH



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FY04 Dredging – Lake Huron to Detroit River

Detroit River MI	100,000
Port Austin MI	19,000
Saginaw River MI	150,000
St Clair River MI	40,000
St Marys River MI (lower completion)	98,000
TOTAL QUANTITY CY – 5 projects	407,000



Detroit River, MI





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FY04 Dredging – Lake Michigan

Arcadia Harbor MI	4,000
Calumet Harbor IL (completion)	310,000
Frankfort Harbor MI	35,000
Grand Haven Harbor MI – Outer	35,000
Green Bay WI	100,000
Holland Harbor MI	21,000
Leland Harbor MI	15,000
Manistee Harbor MI	60,000
Pentwater Harbor MI	16,000
Saugatuck Harbor MI	20,000
Waukegan Harbor IL (completion)	40,000
TOTAL QUANTITY CY – 11 projects	691,000



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FY04 Dredging – Lake Superior

Duluth-Superior Harbor	100,000
Little Lake Harbor MI	25,000
Ontonagon Harbor MI	50,000
St Marys River – upper completion	86,400
TOTAL QUANTITY CY - 4 projects	261,400

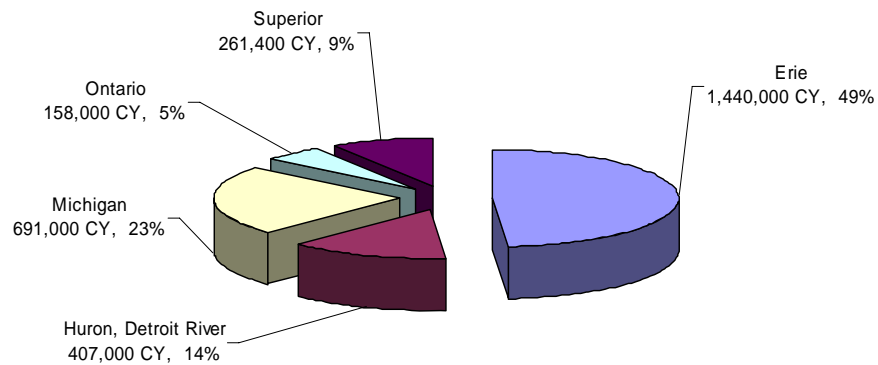




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FY04 Dredging Volumes by Lake



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Drivers for Change

- Declining financial capacity reducing volumes
- Contractors' schedule compression - windows
- Dredging technology stagnation
- Confined disposal costs rising
- Open water disposal further restriction
- Contaminated sediments cleanup increased focus
- Massive backlog; reduced widths & depths
- Shallow draft budgeting emphasis

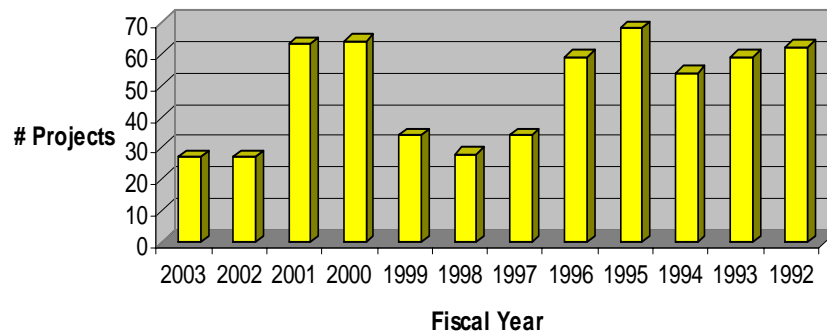


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25 – 50 Dredging projects planned annually

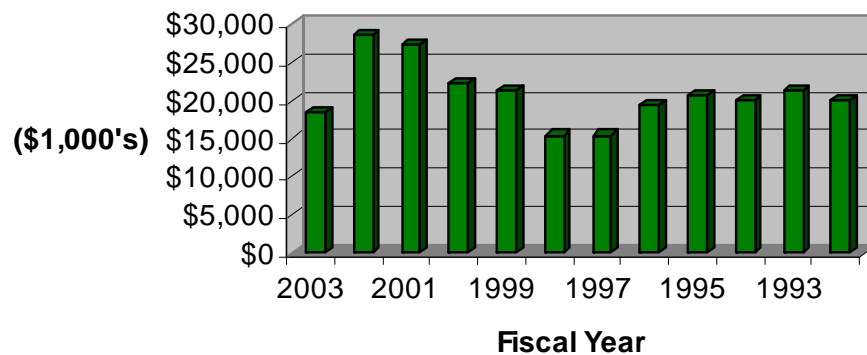
Dredging Projects



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Great Lakes Dredging Expenditures

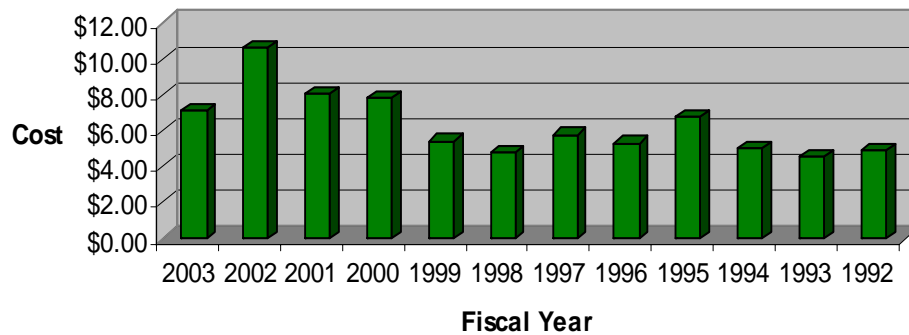




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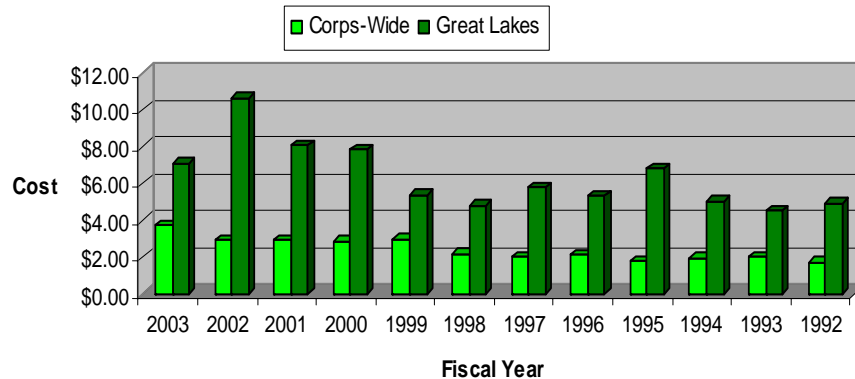
Great Lakes Dredging Cost Per Cubic Yard



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Corps-Wide & Great Lakes Dredging Cost Per Cubic Yard

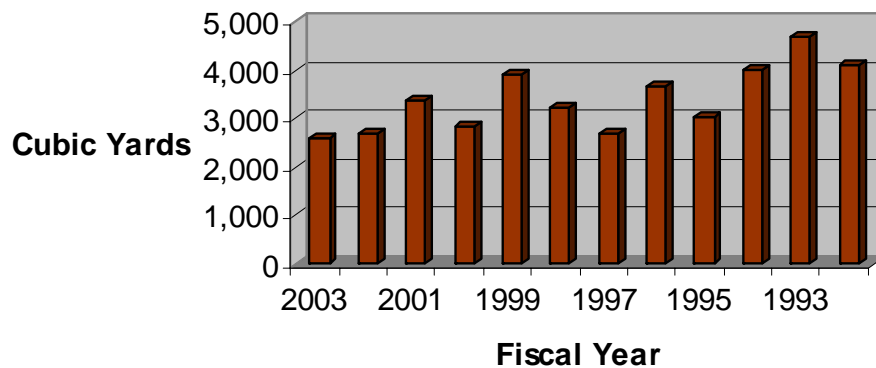




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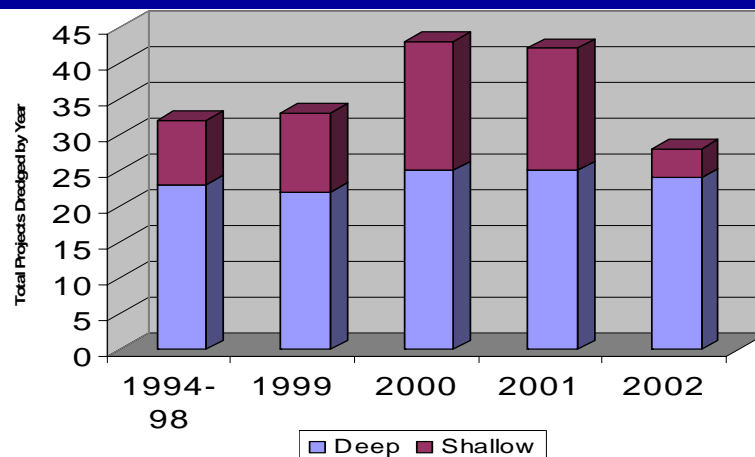
Dredged Material Volumes



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Deep / Shallow Draft Harbors



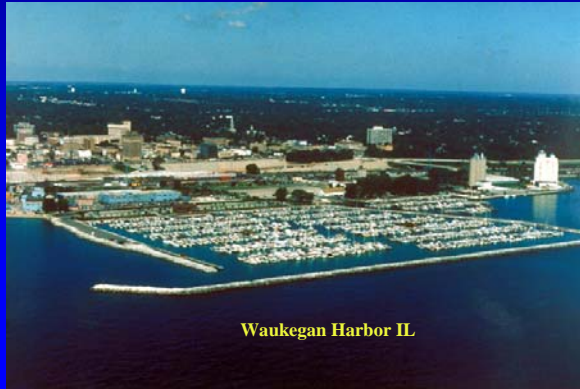


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Navigation Maintenance Projects

Funding Shortfall

- 28 Projects were under-funded or unfunded
- Shortfall to complete all dredging as needed was about \$10.8 M



Waukegan Harbor IL



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Placement of Dredged Material

About half of dredged material goes to confined disposal facilities (CDF); half to open lake disposal

- Confined disposal accounts for 55 percent of material
- Open lake disposal or beach nourishment accounts for 45 percent of material



Pt. Mouillee



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Confined Disposal Facilities

- 44 CDFs constructed on the Great Lakes
- CDF total capacity 101,270,000 CY
- Filled-to-date 70,175,000 CY or 69%



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CDF Construction Costs

- By the end of 1980, average cost per CY was \$4.10
- Current estimate for construction cost is \$28.51 per CY at Indiana Harbor
- By the end of 2006, the aggregate construction costs are projected to exceed \$400,000,000



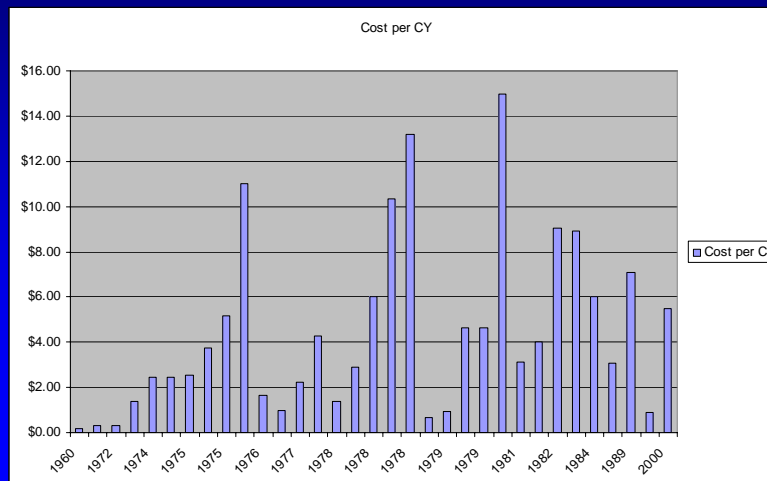
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Navigation Construction Projects



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CDF Construction Costs



Ohio River Dredging

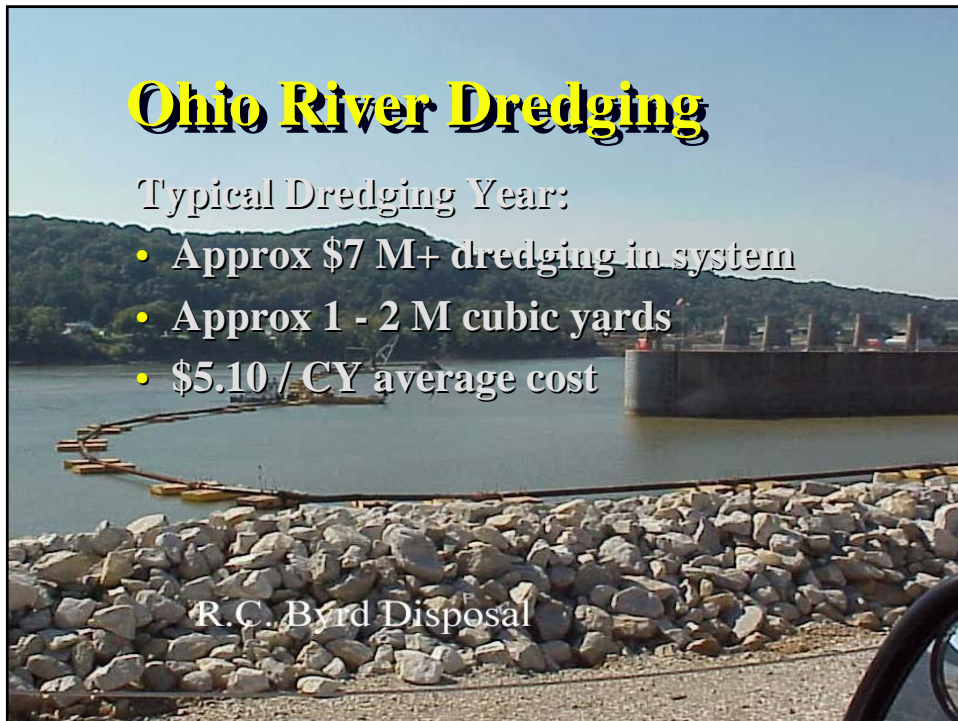


Ohio River Dredging

Typical Dredging Year:

- Approx \$7 M+ dredging in system
- Approx 1 - 2 M cubic yards
- \$5.10 / CY average cost

R. C. Byrd Disposal



Ohio River Dredging

Typical Characteristics:

- Hydraulic cutter head, clamshell
- Indefinite delivery / quantity contracts

